CITY OF OXNARD

MEMORANDUM

August 28, 1970

BRIEFING REPORT

To: City Council

From: Councilman Jane Tolmach

SUBJECT: Citizens' Environmental Study Committee Meeting

As the City Council appointed representative to the Citizens' Environmental Study Committee, I attended its first meeting on Friday, August 28th. As you know, this advisory group was formed by the Ventura County Board of Supervisors to participate in the study to determine what impact an airport facility located at the former Oxnard Air Force Base would have upon the surrounding community. The study will be conducted by the consulting firms of Wyle Laboratories, Litton Environmental Systems and Cornell, Bridgers and Troller.

The Citizens' Committee meeting held on August 28th was not one of the three meetings of this group required under the study's scope of work. Rather, it was a special meeting requested by Mrs. Elizabeth Cuadra, Accoustical Engineer with Wyle Laboratories, who will be conducting the noise pollution aspect of the study. Mrs. Cuadra called this meeting for two primary reasons: to meet with community representatives in order to establish lines of communication in hopes of learning their feelings on the matter of airport related noise pollution; and to explain her specific role in this aspect of the study.

Mrs. Cuadra explained that her responsibility will be to first define the effect which various levels of airport activity will have upon the adjacent community; and her second task will be to then delineate the alternate levels of operating controls which will determine the nature and scope of the airport facility's effect upon the adjacent community. Mrs. Cuadra explicitly stated that no

recommendation will be offered as to what level of operational controls should be adopted, rather that the determination of the level of control is a political decision.

After explaining her role, Mrs. Cuadra outlined the technical methods which will be used in predicting potential noise levels and briefly explained the authority held by local agencies and airport proprietors in controlling the use of airports. She also offered a progress report on the Department of Aeronautic's proposed noise standards for California Airport (copy attached).

At the conclusion of Mrs. Cuadra's presentation, the dates for the three regular meetings of the Citizens' Committee were given: September 18th, September 25th and October 8th. During this project Mrs. Cuadra will keep in contact with the Committee through Mrs. Raines, Environmental Coalition representative, who was designated as the group's "liaison officer" by Supervisor John Conlan who has assumed chairmanship of this committee.

I will attend each of the three meetings of the Citizens' Committee and will continue to keep you informed of its activities.

Robert Brown

Robert Brown
Administrative Assistant I
for
Councilman Jane Tolmach

AN INTRODUCTION TO THE PROPOSED NOISE STANDARD FOR CALIFORNIA AIRPORTS

By Assembly Bill 645 of the 1969 Legislature, the California Department of Aeronautics was mandated to adopt noise standards to govern the operation of aircraft and aircraft engines at airports operating under a permit from the Department. This covers all but military airports and some small private airports which do not invite the general public.

The proposed noise standard (submitted to the Legislature by the Department on April 1) is written to go into the Administrative Code, and is rather technical, because of both its acoustical content and its legal content. The following paragraphs are provided to aid the layman and concerned citizen in understanding what the standard is and would do. However, these few paragraphs are no substitute for a thorough reading and study of the standard itself.

Under the provisions of AB 645 (which you will find in Public Utilities Code Article 3, Chapter 4, Part 1, Division 9), the Department was required to base the standard on two points: (1) the level of noise acceptable to a reasonable person residing in the vicinity of the airport and (2) due consideration of the economic and technological feasibility of complying with the standard.

In arriving at the level of noise acceptable to a reasonable person in the vicinity of an airport, it was necessary to first construct a kind of acoustic scale which would include all the elements that add up to form the total aircraft noise environment around an airport. Once this scale was defined, it was then necessary to determine a numerical value on this scale which would be the limit value for residential areas.

We all know from our own experience that the first thing which is important in how acceptable a given noise event will be to us is how loud the noise is. Other things which count greatly are how long the noise lasts each time we hear it, how often it is repeated throughout the 24-hour time period; and whether it occurs during the day (when we are usually awake and active), during the evening (when we are usually engaged in quiet activities and the whole family is at home together), or at night (when most people want to sleep).

The loudness of a given sound depends both on the physical properties of the sound (its magnitude as measured by a microphone and the way in which the acoustic energy is distributed across the frequency range) and on the response of the human ear to sound at various frequencies. The ear hears best at about 3000 cycles per second, and the hearing acuity decreases gradually at lower and higher frequencies. The A-weighting circuit in sound level meters was developed

to approximate the frequency response of the human ear, and the use of A-weighted sound level is incorporated into the standard. In order to take into account the duration of each individual noise event, the standard uses the time integration of the A-weighted sound level rather than merely the maximum sound level as the aircraft passes by.

The acoustic scale adopted by the standard is the Community Noise Exposure Level (CNEL), and it takes into account all the foregoing factors: magnitude of noise from each flyby, duration, number of flybys, and how the total number is distributed among the three time periods (day, evening, and night).

Each airport generates a noise environment which can be described by drawing noise contours on a map -- lines of equal noise exposure, analogous to lines of equal elevation on a topographic map. These noise contours can be approximately predicated, based on the kinds and numbers of aircraft which will be using the airport and their flight paths in connection with each runway. For an operating airport it is best to verify the contours by measurement, and this is required in the standard. A busy airport with many jet aircraft operations generates noise contours that spread out over many square miles of land; a smaller (or general aviation) airport's contours will not spread as far.

The standard sets a numerical limit on the CNEL scale above which the noise environment is not suited for residential use. That is, a particular noise contour is singled out and identified as the "noise impact boundary." The standard says, in effect, that each airport operator must manage his airport in such a way that this noise impact boundary does not spread so far that it encompasses homes.

In the case of existing airports, many major airports will find they are in violation of the standard. In that case, the airport proprietor must obtain a temporary variance from the Department in order to continue operating, and must begin to take steps to reduce the extent of that noise impact boundary, until eventually it no longer encompasses homes. In the case of proposed new airports, the standard would prohibit any new airport from being located where its eventual use would generate a noise impact boundary that fails to fit the residential land use in the vicinity.

There are many ways in which the airport proprietors, aircraft operators, local governments, pilots and the Department can work cooperatively to diminish noise. Control of the total noise environment around an airport, however, must be coordinated at its point of origin -- the airport. The airport proprietor, acting within his powers as landowner, has some control over the use of his airport, just as each of us who owns a house or piece of property has authorit to control the use of our property. For example, the airport proprietor can encourage the user airlines to use quieter aircraft as

they become available, can regulate which aircraft use which runways during various parts of the day. Through the facilities he provides and the contractual agreements he makes with user airlines, he can affect the rate of increase of flight operations. Although he does not have direct jurisdiction over flight paths at distances from the airport, noise paths can be influenced by preferential runway use. With the cooperation of local government to encourage compatible land use near the airport, it will be possible to preserve the utility of the airport to the community, while achieving environmental compatibility. The proposed standard provides, for the first time, a structure for achieving this goal.

In arriving at the limit value of Community Noise Exposure Level within which the noise is too high for residences, the available data on effects of noise on people was reviewed. These effects include disturbance of sleep, interference with speech communication, physiological stress reactions and the possibility of hearing loss. The most restrictive of these were used in arriving at the limits: sleep disturbance and speech communication. However, these factors only tell us something about limiting the magnitude of the noise, but not about limiting the number of flights. For that information, it was necessary to refer to two other kinds of information: the results of community questionnaire surveys about noise, and a collection of case histories of people's complaints and other actions about aircraft and other kinds of noise in their environment. From analyzing this kind of data, one can determine how much relative importance to place on the number of events and the magnitude of the noise per event.

All of the foregoing factors have been considered in arriving at a limit CNEL value of 65 $CdBA_t$ as the value to place on the noise impact boundary, based on the language in AB 645 regarding the "reasonable person residing in the vicinity of an airport." This value applies to all proposed new airports. For a large, busy metropolitan airport with heavy jet traffic, the noise impact boundary corresponding to CNEL = 65 $CdBA_t$ would encompass many square miles of land. Therefore, in compliance with the second requirement of AB 645 -- that consideration be given to the economic and technological feasibility of compliance -- a slightly less restrictive limit, CNEL = 70 $CdBA_t$, has been proposed for existing airports.

What do these numbers mean, in terms of sound levels that one could go out and measure? For some insight into this, the following simplified example is given: take the limit for new airports, CNEL = 65 $CdBA_t$. Suppose that in a given region the noise environment is dominated by operations from one particular runway and that all the aircraft are equally noisy. Again, suppose the airport proprietor is operating his airport in such a way that the contributions to the CNEL from the three time periods (in the 24 hours)

are equal. The maximum noise level (as measured on the A-scale of a sound level meter) per flight at the boundary would depend on the number of flights per hour from that runway, as follows:

For daytime operations (for CNEL = 65 $CdBA_t$):

Number of Flights per Hour	Typical Maximum Noise Level, dBA
30	74 dBA
10	79
3	84
1	89

For existing airports, for the boundary value of CNEL = 70 $CdBA_t$, the corresponding typical maximum noise levels would be 5 dBA higher. By the noise accounting method proposed in the standard, one night flight operation counts as much as ten equally noisy daytime flights or three evening flights. Thus, there is motivation to shift more flights to the daytime hours (particularly the noisier ones) and to avoid ground runups at night.

The average California residence gives about 20 dBA protection (reduction of noise level from outside to inside) even with some windows open. With windows and doors closed, the average home will give about 28 dBA protection against exterior noise. This information allows one to determine, by subtraction, what the probable interior peak noise levels would be for homes right on the noise impact boundary, and of course they would be less for homes an increasing distance outside the boundary, farther from the flight path of the aircraft. For reference, the peak (outdoor) noise from the average passenger car in California is 68 dBA at 50 feet from the car at speeds typical of residential areas and the vehicle code limit for motorcycles, at speeds typical for residential areas and measured at a distance of 50 feet, is 88 dBA.

The proposed standard also sets single-event noise limits which vary depending on the category of airport (that is, depending on the types of aircraft which would normally use the airport). The noise produced by individual aircraft is to be measured at three specified points near the runway. Exceeding the specified limit at any one of the three points constitutes a misdemeanor on the part of the aircraft operator and is subject to $1000 fine. These single-event limits are not so restrictive that they would change the types of aircraft which presently have access to the various categories of airports; that result would be a byproduct of actions to reduce the size of the airport's noise impact boundary. However, the single-event limits would affect the intoruduction of new, markedly noisier types of aircraft (such as introduction of jets into general aviation fields), by the fact that a field which accepts noisier aircraft

changes its category and would have to institute more complete and more frequent noise monitoring. Further, if the introduction of such aircraft were to expand the noise impact boundary outward into a residential area, it would not be permissible to do so.

Perhaps the reader is familiar with other methods of expressing magnitude of noise, such as perceived noise level (PNL in units of PNdB) or effective perceived noise level (EPNL in units of EPNdB). These are more complicated measures of the noisiness of an individual sound, but they are not as amenable to measurement by practical monitoring systems as the time-integrated A-level adopted in the standard. The following approximate conversions will aid the reader in understanding the numbers in the table above, in perspective with values of noise in PNdB, for example: Consider the maximum sound level of a flyby. The value in dBA, as read from the A-scale of a sound level meter, will be about 12 decibels less than the value in PNdB, and about 14 decibels less than the value in EPN dB, for durations typical at the noise impact boundary.

The standard requires measurement of the noise around the airport, to determine the location of the noise impact boundary and to monitor for single-event violations. It would not be reasonable that a small airport be required to use the same sophisticated and expensive monitoring systems as required at a large airport; therefore, airports are classified into categories such that the monitoring requirements are less stringent for the smaller airports. The acquisition and installation of monitoring systems and the training of staff to operate them will take time. Therefore, the standard establishes a reasonable schedule for this process and for the validation of the location of the noise impact boundary around the airport.

The proposed noise standard calls for the gradual reduction of the noise impact area at existing airports to zero. That is, the goal to be reached is that the noise impact boundary not enclose residential areas. For new airports, it would prevent the existence of a nonzero value of the noise impact area. Thus, for the first time in this country, it provides a structure for solving the noise problem around airports.